

**Section 6**  
**International Harmonized Research Agenda Report**

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**Melbourne, Australia**

**13-16 May 1996**

Results of the Meeting on Sunday, May 12, 1996  
By the ESV Government Focal Points

U.S. Department of Transportation  
National Highway Traffic Safety Administration

## **REPORT ON INTERNATIONAL HARMONIZED RESEARCH AGENDA**

June 1996

### **Introduction**

This report was prepared by the United States, National Highway Traffic Safety Administration, Research and Development, on behalf of the 1996 International Harmonized Research Agenda Committee (IHRA). Committee members are:

Australia	Mr. Peter Makeham	Federal Office of Road Safety
Canada	Mr. Harvey Layden	Transport Canada
European Commission	Mr. Richard Wright	
	Mr. Herbert Henssler	Directorate - General III
European Experimental Vehicle Committee (EEVC)		
	Prof. Dr. B. Friedel	Chairman, EEVC
France	Mr. J. P. Medevielle	INRETS
Germany	Prof Dr. Ing. K-H. Lenz	BASt
Hungary	Mr. Sandor Szabó	AUTÓKUT
Italy	Dr. Claudio Lomonaco	Department of Transport
Japan	Mr. Masakazu Kume	Ministry of Transport
Netherlands	Mr. Gerard J.M. Meekel, M.Sc.	Department of Road Transport
Poland	Mr. Wojciech Przybylski, M.Sc.	Motor Transport Institute
Sweden	Dr. Kåre Rumar	Swedish National Road Administration
United Kingdom	Mr. Keith Rodgers	Department of Transport
	Mr. Richard Lowne	Transport Research Laboratory
United States	Mr. William A. Boehly	National Highway Traffic Safety Administration

## **International Harmonized Research Agenda**

### ***Why an International Harmonized Research Agenda?***

- Injuries are universal in nature
- Globalization of an industry that is affected by motor vehicle regulations
- Provides the foundation for a harmonized regulatory program
- Privatization of R&D Facilities
- Shrinking research dollars and fewer experts in the field
- Emerging Nations seeking to establish a regulatory system
- Injuries are a leading drain on the economics of emerging nations Nation's economy (World Bank Report)
- Opportunity for harmonized motor vehicle regulations
- Improved safety benefits worldwide

### ***Actions Taken During the Time Period September 1994 - April 1996***

The National Highway Traffic Safety Administration (NHTSA) established a team, in September 1994, to develop a paper describing opportunities for increased involvement of international government regulatory agencies in motor vehicle safety research. The paper, outlined the challenges and barriers, and proposed the most viable option, using the U.S. Department of Transportation's International Technical Conference on the Enhanced Safety of Vehicles (ESV) Government Focal Points (GFP) as the forum to establish a steering committee for harmonized research. (Appendix A)

In January 1995, NHTSA sent letters to each of the ESV Government Focal Points detailing its concept of an International Harmonized Research Agenda (IHRA), proposed the ESV Focal Points as the primary contact, and solicited their views and recommendations.

During the time period of February through September 1995, NHTSA held discussions with domestic and foreign automobile manufacturers soliciting views on what such a program should include and the forum for developing an IHRA. Positive feedback and strong desire to move forward at a rapid pace was received in response to the NHTSA proposal. During this same time period, feedback was received from the ESV GFP's. Consensus was reached that the ESV Forum should be used, and the United States should take a leadership role in developing a proposal for agreement among our international partners.

NHTSA Administrator, Ricardo Martinez, M.D., met with the ESV GFP's on November 5, 1995, at a meeting held in conjunction with the 107th Session of WP29 being held in Geneva. During this meeting, Dr. Martinez requested that each representative forward to the United States their respective country's research priorities and the objective for each items submitted. He also presented the following proposal:

- < Use ESV as a forum for developing an IHRA,
- < March 1996 -- GFP's provide U.S. with a list of potential research topics and the objectives of each,
- < April 1996 -- U.S. disseminates responses to participants,

- < May 1996 -- ESV GFP Meeting
  - reach consensus in the selection of research topics
  - identify leadership
  - establish milestones
  - form working groups
- < May 1996 -- ESV Plenary Executive Session -- present actions taken and status on an IHRA.

In April 1996, the U.S. sent to each of the Government Focal Points for their review, comment, and approval an aggregated list of four priority research agenda items and a proposed process/next steps. This list represented the proposals received to date from each country and provided the foundation for the meeting to be held in Melbourne, Australia on May 12, 1996. (Appendix B)

### ***May 12, 1996 Meeting***

A meeting was held with the ESV GFP's prior to the opening of the 15th International Technical Conference on the Enhanced Safety of Vehicles (ESV) for the purpose of:

- < obtaining approval of proposed research priorities,
- < identifying lead countries and their responsibilities,
- < identifying the role of industry,
- < agreeing upon process and next steps.

Nine countries, the EC, and the EEVC were represented at the meeting. (Appendix C) Dr. Martinez, gave the opening remarks, and Mr. Michael Brownlee, Associate Administrator, Safety Assurance, NHTSA, chaired the meeting on behalf of Mr. William A Boehly, Associate Administrator for Research and Development, NHTSA. The representatives reached consensus on an International Harmonized Research Agenda consisting of the elements listed below.

### ***Research Priorities and Lead Countries:***

Based upon original input received from the participating countries, prior to the May 12 meeting, the first four research topics represented the views to date. After further discussion and input two items were added. All items were approved.

### **Biomechanics --United States**

Develop advanced injury criteria and test surrogates for the head, neck, face, thorax, and lower limbs and develop test procedures for all crash modes.

### **Advanced Offset Frontal Crash Protection -- the EC/EEVC**

Develop harmonized test procedures based on real world crashes to assess safety performance and compatibility for offset frontal crashes.

### **Pedestrian Safety -- Japan**

Develop harmonized test procedures based on real world crashes to assess safety performance of passenger vehicles in their interaction with pedestrians.

### **Intelligent Transportation Systems (ITS) -- Canada**

Develop test procedures to assess driver/vehicle interaction and safety potential of ITS crash avoidance and driving enhancement for in-vehicle systems.

### **Vehicle Compatibility -- EC/EEVC**

Develop a harmonized method for assessing compatibility between cars (1st stage) and cars and trucks (2nd stage)

### **Functional Equivalency -- United States in cooperation with Australia**

Develop an acceptable scientific and technical model for determining functional equivalency of existing regulatory requirements,

### ***Process/Lead Country Responsibilities***

#### Process

- < All participating ESV countries/organizations will participate in conducting research on the research priorities.
- < A permanent technical working group will meet every six months to coordinate and follow the IHRA activities. The ESV Government Focal Points will form the core for this working group. (Appendix D)
- < As a cost saving measure and to utilize as many resources as possible, existing international meetings, i.e. SAE International, WP 29, ISO, etc. will be used to hold subsequent meetings for the IHRA.
- < A time frame of 5 years was established for the research agenda. Some priorities, like functional equivalency will be on a much faster schedule. It was further agreed that an IHRA session(s) would be added to the ESV Conference to provide for the reporting of the research.

2 years progress of research to date -- 1998 ESV Conference in Canada

5 years final report -- 2001 ESV Conference -- Location to be determined

#### Lead County Responsibilities

- < Summary of current knowledge report
- < Develop a plan which includes research objectives and end product
  - Identify tasks involved
  - Identify which countries will perform which tasks
  - Identify data collection needs
- < Identify resources needed
- < Establish milestones
- < Establish review procedures
- < Assumes responsibility for administrative process
  - gathering of information

- writing/dissemination of report to all parties involved
- planning meetings, making appropriate notification, disseminating minutes

### ***Role of Industry and other Interested Partners***

It is a given that a harmonized research agenda cannot take place without the involvement of the automotive industry, consumer groups and other interested parties. The representatives agreed that industry should be included in the research. Several points were agreed upon:

- At the SAE meeting to be held in Detroit, February 1997, a separate meeting is to be arranged between the IHRA committee and Automotive Industry Representatives and other interested parties.
- The role of the automotive industry varies from country to country, therefore, each country would work with its industry between now and the February meeting.
- That existing organizations, i.e. ISO, WP 29, EEVC Working Groups, SAE, would be used as resources to the extent possible.
- The United States, would hold a public meeting during the Summer of 1996 to invite all interested parties, i.e. consumer groups, insurance companies, special interest groups, etc. to provide their comments and recommendations.

### ***Next Steps***

- < The U.S. will prepare a written report summarizing the results of actions taken to date. After approval by the ESV GFPs, this report will be presented to the WP 29 committee in June 1996.
- < The first IHRA Committee meeting will be held in Geneva, November 1996, in conjunction with the regularly scheduled WP 29 meeting, but not as a part of the WP29 Session. During this separate meeting, the lead countries will provide an updated status report, and discuss any outstanding issues.
- < In conjunction with the February 1997, SAE meeting, a separate meeting will be held for the 2nd IHRA Committee meeting. Automotive industry representatives and other interested parties will be invited to attend the IHRA Committee meeting. During the SAE meeting lead countries will present their plans relating to the responsibilities described above.

### ***Summary***

It is important to clarify the priority research agenda item on functional equivalency. It is agreed by all parties, that this is being undertaken as a "short term" research function to develop a scientific technical model. It does not mean, nor should it be construed by any individual or organization to mean, that the participating countries have agreed to a moratorium on regulations. The objectives of the undertakings in this agenda are research, not regulatory.

As agreed by the representatives in attendance during the May 12, 1996, meeting, the results of the actions taken and agreements reached on the IHRA were presented during the Plenary Session on Opportunities for Worldwide Harmonized Regulations of the 15th ESV Conference by NHTSA Administrator, Ricardo Martinez, M.D. The conference was held in Melbourne, Australia, May 13-16, 1996.

## **APPENDIX A**

### **INTERNATIONAL HARMONIZATION THROUGH COORDINATED RESEARCH**

(Draft, 10/3/94)

#### **ABSTRACT**

The purpose of this paper is to suggest how to increase the involvement of international government regulatory agencies in common research areas as a means to help resolve incompatible regulations. The paper discusses the organizations currently involved in international harmonization of regulations, the challenges of harmonization and research cooperation, and several options for increasing NHTSA involvement in international research.

#### **PROBLEM/BACKGROUND**

Increasing the worldwide compatibility of vehicle safety regulations can help facilitate international trade and improve, motor vehicle safety. NHTSA currently works with several organizations focusing on international harmonization. The primary forum for harmonization is the Working Party on the Construction of Vehicles (WP29) of the UN/ECE (United Nations Economic Commission for Europe). WP29 receives recommendations for regulations through working groups composed of government and industry technical representatives, including participation by the U.S. and Japan. The AAMA (American Automobile Manufacturers Association) participates in the working groups and informs NHTSA about their international harmonization activities. NHTSA Rulemaking representatives attend the government committees supporting the WP29.

NHTSA is also the primary supporter of the Enhanced Safety Vehicle Conference (ESV) which is a forum for information on worldwide research activities. A spinoff of ESV is the European Experimental Vehicles Committee (EEVC), which is composed of representatives of European government research facilities. Its purpose is to help exchange technical information between governments and ensure that they collaborate on motor vehicle research. It also acts as a technical advisor to the European Economic Community (EEC). Non-European countries can be observers in the various EEVC working groups, e.g., NHTSA representatives in Working Group 12 on the Improved Frontal Impact Dummy.

In the area of research, NHTSA has directly sponsored or coordinated work at international research organizations that may develop a basis for regulatory action. Examples of such efforts, e.g. initiating human factors research at the TNO research institute in The Netherlands to study driver response to

headlight glare, coordinating basic biomechanics research at the University of Heidelberg, and coordinating vehicle to vehicle side impact testing with Transport Canada.

Although these avenues can be effective, more concerted action at the research level is needed to provide a common basis for possible worldwide actions to harmonize vehicle components/performance, measurement procedures, definitions of regulatory terms, and specific performance values or component designs. Without strong research that is accepted worldwide, developing compatible regulations through national and regional regulatory/advisory bodies such as WP29, ISO, and the EEC may have a limited chance of success. When a government is considering a new safety regulation, the main supporting research is usually complete and the associated test devices, injury criteria, etc. are typically developed, making it too late for achieving effective compatibility of requirements.

## **CHALLENGES OF INTERNATIONAL RESEARCH COOPERATION TO SUPPORT VEHICLE SAFETY REGULATIONS**

There are several challenges associated with international cooperative research and the development of compatible safety regulations. Many of these challenges relate to the differences in the safety environment and approaches to regulation between countries. These differences include:

The motoring environments are different in different countries. For example, the U.S. has more air bag equipped vehicles, more large cars, and different road characteristics. Also, and most important, the accident pictures are different. European and Asian countries have a larger proportion of crashes involving pedestrians, bicyclists, and motorcyclists. Also, fatalities are a larger proportion of the total harm caused by motor vehicle crashes.

The regulatory process is not the same in the different countries. The U.S. does not have type approval of vehicles as Europe does. This means that in Europe, Governments are involved in the safety certification of motor vehicles and equipment. In the U.S. we have self certification in which manufacturers certify that their vehicles meet regulations.

Another challenge is the difference in the relationship between the governments and auto industry which leads to a different political environment for safety regulation. In Europe, the relationship is less adversarial than here.

Different countries have different priorities relative to their auto industry. Fuel economy and vehicle cost may supersede auto safety as areas of higher priorities. Therefore, some governments provide commensurate funding levels for automotive safety research.

In some countries, e.g., some of the European community, the regulatory organizations do not control or directly support the research organizations. Thus, there is no guarantee that the governments will be committed to turning research results into rulemaking. On the other hand, research is part of the regulatory structure in the United States.



The above factors can result in differences in research priorities and the capabilities to support certain types of research. These factors also lead to the resolution of harmonization issues that rely more on the basis of political arguments than on research findings.

An administrative issue restricting NHTSA participation in international research is that both travel funds and support staff have been consistently too limited to allow technical representatives to participate fully in overseas meetings and to sponsor meetings and coordinated research efforts.

## **PROPOSED APPROACH TO INTERNATIONAL HARMONIZATION-RELATED RESEARCH**

To enhance the success of international research cooperation and to cultivate an environment supportive of harmonization, the international partnering should be initiated at the research and working level. It should focus on areas of commonality and comparable needs. It should aim for common test devices, common test procedures and common data exchange formats. The research should also focus on issues that are more susceptible to resolution by research support than by political factors. For example, research could be coordinated in the following areas: the response of the human body to crash forces, dummy design, the deformation of vehicle materials, the performance capabilities of drivers, advanced analytical and structural modeling tools, etc. These areas have universal research interest and the same test devices and criteria can be developed. This approach would hopefully enhance worldwide vehicle safety and may distribute the development costs even if the application of the results and the corresponding regulation are not exactly the same in different countries.

## **PROPOSED FRAMEWORK FOR INTERNATIONAL RESEARCH COOPERATION**

The proposed framework for international research cooperation could be structured as follows:

- A. Utilize the ESV forum to set up a steering committee for International Research Cooperation and Harmonization. This committee would be composed of the heads of Research and Development (R&D) of any country who wishes to participate. Logistically, this steering committee can be an ESV working committee. The basic functions of this committee are to:
  - 1. Identify the general topics/areas for cooperative research:
    - a. Identify common existing and planned vehicle safety research areas worldwide
    - b. Identify common planned regulations worldwide
    - c. Identify new areas for research at international level based on a. and b. above and data needs
  - 2. Identify research priorities under categories of:
    - a. Basic research
    - b. Common test procedures and formats for data exchange
    - c. Development of research tools

3. Determine how to implement research:

- a. Where should research be performed?
- b. Where will funding be obtained?
- c. How will research be coordinated among interested parties?

B. For each area, set up intergovernmental research teams whose members are designated by the steering committee. Upon government discretion, consultants can be designated as team members for certain program areas. Each team will have a team leader. The position of team leader will rotate on a yearly basis from one country to another.

The team members would be represented in associated ISO, SAE, EEVC working groups/committees, etc.

They communicate through the Internet, i.e., via electronic mail as a group forum (group mailing list) with quarterly updates on progress including testing and new activities. The team leader is responsible to provide a quarterly update (via the Internet if applicable) to the steering committee. The quarterly report should provide feedback to the steering committee relating to part A. above and progress in the different research conducted.

Other than primarily sharing ideas and findings, the teams are charged with the following goals if applicable:

1. Establish/develop joint testing and evaluation programs for new procedures, instrumentation and dummy.
2. Exchange analytical models (e.g., finite element models of vehicles, dummies, and humans) advanced tools, and test data.
3. Establish harmonized formats for data interchange, and structural models of occupants and vehicles.

C. As part of the ESV International Congress that takes place every two years, set up a session on "International Research Cooperation and Harmonization" with a panel discussion by the steering committee. This session will be chaired by a steering committee member on a rotation basis from each country represented. The functions in part A. above will be revisited at this session.

D. In each participating government, as part of the R&D office, bring in new (or currently designated) staff (one or two people) dedicated to support International Research Cooperation and Harmonization. Also, designate a new budget item to support the international cooperation effort and provide travel funds for the research team members. The support functions of the new staff include:

1. Set up and maintain the Internet group mailing list and insure communication among the research teams and with the steering committee members.
2. Coordinate and setup the ESV session
3. Coordinate with and support other agency staff that are represented in the various international bodies (in our case the Director of International Harmonization and several staff members from Rulemaking and Plans and Policy)
4. Set up meetings as needed for the different research teams and the steering committee.

## **ALTERNATIVE PROPOSED FRAMEWORKS**

1. NHTSA could solicit topics for international research cooperation with a Federal Register Notice and dissemination of the notice overseas to various international organizations and government regulatory agencies. NHTSA could then identify the high priority research issues related to a critical harmonization problem. NHTSA could solicit international partners to plan, fund, and conduct the research based on the research priority, feasibility, and availability of funding.
2. NHTSA could request the EEVC set up working groups to formulate specific research statements of work, identify experts to participate, fund the research, monitor the progress, and report the results to the ESV conference. The EEVC could arrange for the working group leaders to set up e-mail communications via INTERNET with all parties interested in the research topic. Although, EEVC is primarily a European organization, it has been opening its deliberations to other countries and thus may be a good forum for international research cooperation.

## APPENDIX B

April 8, 1996

Dear:

Over the past several months, in response to the International Harmonized Research Agenda (IHRA) meeting held on November 9, 1995, in Geneva, many of you have sent us your country's research priorities. During this meeting, it was also agreed to hold a subsequent meeting at the 15th ESV Conference in Melbourne, to:

- ! arrive at an agreed upon set of priorities.
- ! identify a lead country for each priority,
- ! agree upon a process,
- ! agree upon the next steps,
- ! make an announcement on actions taken to date.

Before I get to the proposals and our next steps, I want to share with you a couple of related items.

1. Meeting Date. Based on the responses received, from you the Government Focal Points, it is a pleasure for me to extend to you an invitation to attend the Harmonized Research Agenda meeting with Dr. Martinez, SUNDAY, MAY 12, 1996, 2:30 p.m. - 4:30 p.m.. The meeting location is the Howqua Room, World Congress Centre, Melbourne, Australia.
2. EEVC Participation. While examining the enclosed materials, you will notice there is no formal response from the Chairperson of the EEVC. I am, however, pleased to inform you that we held an informal telephone conversation with the EEVC Chairperson, and shared with him the responses received. While he could not give a commitment for the EEVC to take a leadership role, or become an active participant without first consulting with the participating countries, he has indicated an interest for the EEVC to become an active participant in this effort.

In an effort to help facilitate the process of identifying international research priorities, we have received proposal from many countries (these are enclosed as Attachment A). To move to the next step of developing the research priorities that all could agree upon, the United States synthesized the proposals in order to develop the research priorities. These research priorities reflect what the majority of countries felt should be undertaken. The proposed list is enclosed as Attachment B. As the next step, prior to the meeting in Melbourne, we would ask that you

- ! provide us with your approval and/or comments on the recommended priorities,
- ! make a recommendation or assume a leadership role for each priority,
- ! provide comments on the proposed process/next step.

Recognizing that the Conference is four weeks away, and to allow for enough time for the U.S. to provide you with additional feedback, please provide your response by April 20th. The enclosed form has been developed in an effort to expedite this request.

Also enclosed you will find information regarding:

Suggested Process/Next Step (Attachment C),  
Proposed Agenda for May 12 meeting (Attachment D), and  
Response Form (Attachment E).

In closing, it is with deepest regrets that I must tell you that I cannot attend the 15th ESV Conference due to unforeseen personal matters. My colleague, Mr. Michael Brownlee, Associate Administrator for Safety Assurance will be representing me during the Conference, and will serve as Conference Chair along with Mr. Peter Makeham. I wish you a most successful conference. I am confident that Mr. Brownlee will demonstrate the leadership role deserving of this vital event, as well as address any issues or concerns that may arise during the conference, the Government Focal Point luncheon and the Harmonized Research Agenda meeting. As always, Linda and I stand ready to be of any assistance or answer any questions you may have.

Sincerely,

William A. Boehly  
Associate Administrator for  
Research and Development

Enclosures

Telephone: 202-366-5929  
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INSTITUT NATIONAL DE RECHERCHE  
SUR LES TRANSPORTS ET LEUR SÉCURITÉ

L'Ingénieur en Chef des Ponts et Chaussées  
Directeur délégué du Centre de Lyon-Bron  
Le Directeur Général Adjoint

BRON, le 20 Février 1996

**FAX TO M. BOEHLY  
ASSOCIATE ADMINISTRATOR FOR R. and D.  
NATIONAL HIGHWAY TRAFFIC AND SAFETY ADMINISTRATION  
U.S. DOT**

SUBJECT: global research and development program for safety vehicle standardization.

I apologize not to answer quicker to your proposal about the setting up of a global research and development program for safety vehicle standardization.

Firstly France thinks that on behalf of European Union Treaties it is impossible to answer directly to your question at a level that is not a European one.

Secondly for this purpose, France supports the idea that the good body should be E.E.C.V. where the State members DOTs of E.U. are members as public research institutes involved in safety standardization research programs.

Thirdly, the needs for research program for preparing standardization are discussed and presented to share funding between E.U. and State members.

Fourthly for France, the only acceptable international forum for the harmonization is the WP 29 of UNO EEC in Geneva.

Fifthly, it should be - within the budget reducing context - the one possibility for European State members to take case of this problem.

With my best regards

Jean-Pierre MÉDEVIELLE  
Deputy General Director of INRETS  
ESV French Governmental Focus Point

c.c.: M. FRIEDEL Chairman of EEVC  
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Mr William A Boehly  
Associate Administrator, R&D  
NHTSA  
400 Seventh Street. S.W.  
Washington, D.C. 20590

Date: 24 January 1996

Dear Mr Boehly

International Harmonisation of Research.

Thank you for your letter of 26 December 1995, enclosing the presentation made by Dr Martinez in Geneva. This was very helpful since, regrettably, I was unable to attend the meeting in Geneva.

I shall be pleased to participate in the proposed meeting in Melbourne. I can attend at any of the times suggested, but my preferences (in order) would be Sunday 2 - 5:30 and Friday 9:30-12:30.

I have discussed the list of research topics that might be suitable for a harmonised approach with my colleagues in the UK DoT and you will receive a consensus response on that from Malcolm Fendick.

I am very enthusiastic about a cooperative approach to researching the problems of vehicle safety and, indeed, made that point strongly in my paper to the 1991 SAE Govt/Industry meeting in the session on the biomechanics research needs for the 1990s. I also try to ensure as wide an input as possible to the EEVC Working Groups that I chair. Apart from the obvious optimisation of resources, it should form a good basis for a degree of harmonisation of test procedures, if not complete regulations. At least the legislative procedures would be based on the same common knowledge base.

Yours sincerely

Richard Lowne

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OF TRANSPORT

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Mr William A Boehly  
Associate Administrator for  
Research and Development  
US Department of Transportation  
National Highways Traffic Safety Administration  
400 Seventh Street S.W.  
Washington, D.C. 20590

25 January 1996

Dear Mr Boehly

Thank you very much for your letter of 26 December to Malcolm Fendick on the harmonisation of research. I have been asked to reply as I will be representing Mr Fendick at the ESV Conference in Melbourne.

We have discussed with TRL the areas of research which we both feel will be suitable for international harmonisation. These topics are:-

Priority	Title/Description
1	Biomechanics and (Frontal) dummy development
2	Development of a new generation of side impact dummies
3	Brake compatibility of vehicle combinations
4	Antilock brakes, their influence on accidents
5	Crashworthiness compatibility of cars
6	Impact testing for motorcycles
7	Development of a range of new child dummies

With regard to the discussions to be held at the 15th ESV in Melbourne I would suggest meeting earlier in the week rather than at the end and therefore the two periods which I favour would be:

2:00pm - 5:30pm - Sunday May 12  
5:30pm - 8:30pm - Thursday May 16



Hopefully this will allow our return flights to be booked on Friday May 17.

I look forward to meeting you at the Conference.

Yours sincerely

KEITH RODGERS

Vehicle Standards & Engineering Division

TELEFAX    TELEFAX    TELEFAX    TELEFAX    TELEFAX

Date: March 10, 1996

Pages: 1 +3

To: - Mr William A. Boehly, Associate Administrator for Research & Development,  
NHTSA, Washington DC, USA

Fax: 0091 - 202 366 5930

From: Kåre Rumar, SNRA, S-781 87 Borlänge, Sweden

Fax office: + 46 243 75 773

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Re. Harmonized vehicle research within ESV'

Dear Mr Boehly,

Attached you will find my comments and answer to the US initiative and suggestions. Initially I have tried to structure my comments and after that I am presenting my suggestions for a prioritized list of research topics. These topics are split into two parts -- active and passive -- which I consider to be almost incomparable.

A. Comments

1: Do we need a better coordination of vehicle safety research with the purpose of reaching worldwide harmonized vehicle regulations in the area of road safety?

- Yes!

2: Is ESV the right forum for such a worldwide coordination?

- Yes and no! EEVC is presently doing a very good job, of course in Europe and especially within some prioritized areas. That work should not be disturbed but coordinated with corresponding activities in other regions. ESV has the advantage of working world wide and having a natural forum for presentation and discussion of the research -- the conference. One important aspect is that vehicle safety research should be more open. That speaks for ESV. There are various ways to solve this potential conflict. Such a solution should also involve UN ECE WP 29 and its working groups because it is there that most of problems appear and where most of the decisions are made.

B. Prioritized research topics

See attached list!

Yours sincerely

Kåre Rumar  
Professor

Prioritized research topics

These proposals are split into two parts - active safety and passive safety. During the last decades we have no doubt been more successful in the area of passive safety to a large extent due to initiatives coming from ESV. Personally I think the concept of risk compensation has been misused in the meaning that it has been argued that improvement of active safety is impossible due to risk compensation. As I see it that is the wrong conclusion. More knowledge of the risk compensation mechanism should be used to come up with proposals of how to prevent risk compensation (e.g. by speed limiters).

A. Research proposals to improve active vehicle safety

23. Task: Study the interaction between driver behaviour and vehicle characteristics concerning active safety (risk compensation)  
Objective: Develop harmonized methods and techniques that make it possible to tailor vehicle characteristic to driver characteristics, to prevent risk compensation reactions and to predict the safety potential of various active safety systems (brakes, steering, stability, visibility, conspicuity, speed limiters, belt usage control, black boxes etc)
24. Task: Analyze the safety effects of various proposed in-car-ITT systems (navigation, ICC, collision avoidance, driver monitoring etc)  
Objective: Establish harmonized requirements on in-car ITT systems – especially long time effects, effects of function integration (adding of several functions) and effects of system malfunctioning. The purpose is both to avoid increasing risks and to Increase safety
25. Task: Study stability, steerability and braking performance of vehicles especially in curve driving and avoidance manoeuvres -- both heavy vehicles and vehicle combinations and passenger cars  
Objective: Harmonize test methods and based on those methods establish harmonized stability, steerability and braking performance requirements that will increase safety especially of heavy vehicles and vehicle combinations. This includes IT-functions that improve vehicle handling characteristics.
26. Task: Study vehicle headlight performance especially the low beam function  
Objective: Establish harmonized headlight requirements that will increase driver visibility conditions and thereby safety in night traffic
27. Task: Study methods for accident-in-depth investigations  
Objective: Establish improved and internationally agreed methods to study accidents by means of accident-in-depth methods

B. Research proposals to improve vehicle passive safety

1. Task: Study the chock mechanisms, the tolerances and the injury criteria of the neck in car crashes  
Objective: Establish harmonized test methods and criteria to be used in crash tests and in simulations.
2. Task: Study various ways to design intelligent protection systems  
Objective: Establish needs and methods to trigger and control the characteristics of the protection systems based on individual parameters and position, on the crash condition and seriousness. Establish harmonized requirements on intelligent protection systems
3. Task: Study the construction variables that decide the crash performance of cars in real crashes.  
Objective: Establish an international rating system that makes it possible to predict already in the construction phase the crash performance of the car in real crashes
4. Task: Study vehicle compatibility in various collision types, especially between heavy vehicles and passenger cars (NB this is a project where EEVC (WG 15) is active and proceeding)  
Objective: Establish harmonized compatibility requirements on various types of vehicles to reduce injury patterns (NB this compatibility task should also include two-wheelers)
5. Task: Study the collision characteristics in various collisions between car and road side furniture (poles, trees etc)  
Objective: Establish harmonized car and road furniture design that Interact to minimize the violence on the human body in car collisions
6. Task: Study crash characteristics In higher speeds (more than 70 kmh)  
Objective: Establish harmonized vehicle requirements that reduce the violence against the human body at car collisions in higher speeds
7. Task: Study the relation between seat performance and injury patterns in various car collisions - especially rear end collisions (NB this project is related to and partly an alternative to project 1 above)  
Objective: Establish harmonized seat requirements that reduce human injury, severity and frequency in car collisions - especially rear end collisions
8. Task: Study the crash biomechanics, the tolerances and the injury mechanisms of the brain in car crashes  
Objective: Establish harmonized injury criteria to be used in crash tests, in simulations
9. Task: Develop an improved frontal collision dummy which better corresponds to the performance of the human body (NB this is a project where EEVC is active)  
Objective: Use that harmonized and more valid collision dummy in national and international testing of vehicle performance in collisions

10. Task: Develop an improved side collision dummy (global SID) which better corresponds to the performance of the human body  
Objective: Use that harmonized and more valid side collision dummy in national and international testing of vehicle performance in collisions
11. Task: Study the violence and injury patterns caused by vehicles on pedestrians in collisions (NB this is a project where EEVC already has a proposal)  
Objective: Specify harmonized functional requirements on vehicle fronts in order to reduce pedestrian injuries in collisions with cars
12. Task: Develop methods that make it possible to predict from vehicle and vehicle component design and protection system the violence on the human body in car collisions  
Objective: Agree on harmonized prediction methods to estimate the violence against the human body in car collisions

Preliminary proposals within an internationally coordinated research aiming at improved and harmonized vehicle safety standards.

**A: Passive safety**

- The shock biomechanics, tolerances and injury mechanisms of the brain
- The shock biomechanics, tolerances and injury mechanisms of the neck
- Side collision dummy (global SID)
- Vehicle compatibility in various collision types
- Vehicle seat performance to protect from rear collision injuries
- Protection against lower limb injuries in frontal collisions
- An improved frontal collision dummy corresponding better to the performance of the human body
- Vehicle protection performance at very high speeds (more than 70 kmph)
- Reduced violence levels from heavy vehicles in collisions
- Reduced violence levels from automobiles in collisions with pedestrians
- Interaction between road furniture and vehicle characteristics in collisions
- Shatterless, scratch resistant and energy absorbing vehicle windows
- A general description of present knowledge concerning human biomechanical limitations
- Development of methods to predict the effect on collision safety of various vehicle designs, protection systems and other factors
- Intelligent protection systems

**B. Active safety**

- Development of methods to predict the safety potential of various active safety systems (e.g. braking, steering, stability, visibility, conspicuity, etc)
- Safety potentials of various proposed IT-functions (e.g. navigation, ICC, collision avoidance, driver monitoring, etc)
- Improved braking performance especially of heavy vehicles and vehicle combinations
- Harmonized and improved vehicle headlight performance (especially low beam)

Transport      Transports  
Canada        Canada  
Surface        Surface

344 Slater Street  
Ottawa, Ontario  
K1A 0N5

December 15, 1995

ASF 1206-2

Mr. William A. Boehly  
Associate Administrator for Research and Development  
National Highway Traffic Safety Association  
Department of Transportation  
400 Seventh Street, S.W.  
Washington, D.C., 20590  
U. S.A.

Dear Mr. Boehly:

In response to the meeting held in Geneva with Dr. Martinez, I have attached two lists of activities we suggest for consideration as international cooperative research: one deals with biomechanical tolerance data and injury criteria, and the other deals with human factors related research.

In addition, we reviewed and fully support the list of detailed items provided by Mr. K. Rumar of Sweden that was handed out at the meeting in Geneva (copy attached).

As I stated at the meeting, we welcome and look forward participating in this endeavor.

Yours truly

J. Layden  
Director  
Motor Vehicle Standards & Research

Attachments

# **BIOMECHANICAL TOLERANCE DATA AND INJURY CRITERIA**

## **BACKGROUND**

The performance of vehicles in protecting their occupants is commonly evaluated by measuring specific responses of anthropomorphic dummies in simulated collisions. Those responses are then (usually) manipulated in some way, so that the results may be compared with the values of various injury criteria. The values of the criteria are intended to represent the levels of specific types of mechanical insult that are tolerable by defined subsets of the population of vehicle occupants.

The criteria and the associated performance levels are, however, often set by reference to data obtained twenty or more years ago, under poorly defined and controlled experimental conditions and using primitive data acquisition systems. The validity of the resulting criteria and associated tolerance levels may further be called in question by fundamental errors of experimental design and analysis. Basic errors embodied in the formulation of injury criteria that are widely accepted to-day include:

- (1) assuming that the occurrence of human injury under a range of different dynamic conditions may be predicted from a rigid-body kinetic response of a dummy;
- (2) assuming the existence of a statistical association between a dependent (response) variable and an independent (input) variable when all accepted statistical methods show inputs and responses to be uncorrelated;
- (3) defining an injury criterion exclusively on the basis of statistical association, in the absence of any basis in mechanics for the relevant injury mechanism.

## **PROPOSAL**

A two-stage approach is suggested. In the first stage, the theoretical and experimental bases of the principal existing injury criteria would be subjected to an impartial and objective review, concentrating on such fundamental questions as the validity of experimental designs, the control of experimental conditions and measurements and the statistical analysis and interpretation of results. (In this context, impartiality implies that authors of the original work leading to a particular criterion not be parties to the review.)

Having conducted the review of existing injury criteria and associated levels, an international co-operative research plan might then be proposed to remedy deficiencies in the formulation of specific criteria or in the empirical basis of existing criteria and tolerance levels.



## **Selected<sup>1</sup> Human Factors Research Needs in Traffic Safety: Opportunities for Collaboration**

### **1. Intelligent Transport Systems**

#### Basic research issues

- safety evaluation test protocol development
- workload measurement and regulation
- ITS and behavioural. adaptation

#### Applications

- collision warning systems: human factors considerations
- driver impairment detection and intervention
- cellular telephone use: impact on safety
- human factors performance standards for navigation systems
- HUD performance criteria
- legibility criteria for visual and auditory in-vehicle displays

### **2. Vision and Lighting**

- issues related to driving with enhanced vision systems (IR, laser radar) under visually degraded conditions due to driving at night, in fog, rain, snow, etc: e.g., effects of display location, field of view, and transfer of visual orientation.
- indirect vision enhancement (proximity sensors)
- definition of requisite visibility areas for window size and location, mirrors, obstruction due to headrests and other vehicle structures
- effects of vehicle styling: e.g., window rake angle, etc.
- night driving performance
- window tinting

### **3. Fatigue**

- role of sleep-deprivation, task monotony and stress on the nature and extent of fatigue
- fatigue interventions (trucks, private motor cars)
- role of habituation in accident causation (resulting from radical change in road and/or vehicle environment)

### **4. Restraint Usability**

- child restraint system usability
- usability criteria for lap and shoulder belts
- human modeling - anthropometric criteria

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<sup>1</sup> Pertaining to ASF mandate. There are numerous other Human Factors issues pertaining to older drivers, driver training and licensing, etc.

**PROPOSED INTERNATIONAL R & D PROJECTS**  
**(In order of priority for Canada)**

**1. OCCUPANT RESTRAINT SYSTEMS**

**Seat Belts:**

- , Belt Deployment Test Device (BTD)
- , Reduction of Abdominal Injuries

**Supplemental Restraints (Air Bags):**

- , Deployment thresholds, e.g. seat belts worn or not, seat occupied or not
- , Aggressivity

**Child Restraints:**

- , Incompatibility of CRS and seat belts
- , ISOFix, CANFix, and other potential attachment mechanisms as alternatives (GM Clinic)
- , Tether anchorage

**Other Technology:**

- , Load Limiter
- , Pretensioner
- , Air Bags Sensors

**Restraint Usability:**

A major problem with existing occupant restraints is poor usability (ease of correct use) and/or fit. In the case of children, available evidence suggests that approximately one third of child passengers in automobiles are not properly restrained in infant or child restraint systems (CRS) and, consequently, are exposed to increased risk of injury in the event of collision. A significant part of the problem is incorrect installation of the CRS in the vehicle. There is a need to improve the compatibility of, CRS and vehicles. There is also a need to develop a standardized usability test procedures for measuring the ease with which a CRS can be correctly installed. A recent Transport Canada study employed a usability protocol to identify specific design problems with CRS's and provide valuable information on user behavior.

Further development of the protocol is required before usability testing can become required practice within the restraint system industry. Similarly, there is a need to develop usability criteria for all classes of occupant restraints. Relevant issues include:

- , child restraint system usability - development of test protocol
- , development of usability criteria for lap and shoulder belts;
- , human modeling - antropometric criteria

**2. HUMAN IMPACT TOLERANCE DATA AND INJURY CRITERIA**

## **BACKGROUND**

The performance of vehicles in protecting their occupants is commonly evaluated by measuring specific responses of anthropomorphic dummies in simulated collisions. Those responses are then (usually) manipulated in some way, so that the results may be compared with the values of various injury criteria. The values of the criteria are intended to represent the levels of specific types of mechanical insult that are tolerable by defined subsets of the population of vehicle occupants.

The criteria and the associated performance levels are, however, often set by reference to data obtained twenty or more years ago, under poorly defined and controlled experimental conditions and using primitive data acquisition systems. The validity of the resulting criteria and associated tolerance levels may further be called in question by fundamental errors of experimental design and analysis. Basic errors embodied in the formulation of injury criteria that are widely accepted today include:

- , assuming that the occurrence of human injury under a range of different dynamic conditions may be predicted from a rigid-body kinetic response of a dummy;
- , assuming the existence of a statistical association between a dependent (response) variable and an independent (input) variable when all accepted statistical methods show inputs and responses to be uncorrelated;
- , defining an injury criterion exclusively on the basis of statistical association, in the absence of any basis in mechanics for the relevant injury mechanism.

## **PROPOSAL**

A two-stage approach is suggested. In the first stage, the theoretical and experimental bases of the principal existing injury criteria would be subjected to an impartial and objective review, concentrating on such fundamental questions as the validity of experimental designs, the control of experimental conditions and measurements and the statistical analysis and interpretation of results. (In this context, impartiality implies that authors of the original work leading to a particular criterion not be parties to the review.)

Having conducted the review of existing injury criteria and associated levels, an international co-operative research plan might then be proposed to remedy deficiencies in the formulation of specific criteria or in the empirical basis of existing criteria and tolerance levels.

## **3 COLLISION AVOIDANCE**

### **Intelligent Transport Systems**

Advanced in-vehicle transport information and control systems introduce auxiliary tasks that require some degree of interaction with the driver. To minimize the risk of driver distraction, confusion or overload it is important for designers and regulators to understand the performance tradeoffs of alternative driver interface designs. Previous Transport Canada studies have attempted to determine the potential of auxiliary tasks to interfere with driving and to develop specialized techniques for evaluating the ergonomics and safety of such systems. Current research is aimed at further developing experimental paradigms for safety evaluation and applying these to address specific issues such as the relative safety of visual and auditory auxiliary displays. Related research issues which would benefit from international collaboration include:

- , safety evaluation test protocol development
- , workload measurement and regulation
- , ITS and behavioural adaptation

### **Human Factors - Vision and Lighting:**

There are a multitude of vision and fighting research issues, some of which are fundamental in nature but remain unresolved and others which arise from advances in automotive technologies. There is a need to consolidate the data that do exist and to embark on new research to advance our knowledge in the area. The topics listed below illustrate the breadth of this area.

- , issues related to driving with enhanced vision systems (IR, laser radar) under visually degraded conditions due to driving at night, in fog, rain, snow, etc. e.g. effects of display location, field of view, and transfer of visual orientation
- , indirect vision enhancement (proximity sensors)
- , definition of requisite visibility areas for window size and location, mirrors,
- , obstructions due to headrests and other vehicle structures
- , effects of vehicle styling, e.g. window rake angle, etc.
- , night driving performance
- , window tinting

### **Data Recorders**

There is a widely held opinion that crash avoidance would be advanced if more information were available about vehicle and driver parameters in the moments leading to a crash. Technology is available to capture and record certain data in a vehicle "black box" for use by researchers and traffic authorities. The development and widespread implementation of this kind of initiative has not received serious attention to date largely because it is likely to have low public acceptance.

There are certain classes of vehicles and groups of drivers, however, for which such devices could be targeted. A collaborative research project aimed at exploring the feasibility of the concept and developing a standard data recorders may have an important influence on future crash avoidance directions. In particular there is a need to identify the critical variables that could be recorded, assess their value in terms of their contribution to a more complete understanding of the causes and precursors of the crash, and specify technical requirements for the data (e.g., resolution, sampling frequency, recording duration, etc.).

## **4. REAR IMPACT PROTECTION**

Rear Restraints/Seat Back Strength:

- , Identification of updated Counter-measures
- , Validation of Counter-measures

## **5. SIMULATED TESTING/MODELING**

This project is aimed at exploring the possible use (and limitations) of computer modeling not only for design work, but also for testing, certification and compliance verification. Proper seat belt fit is one application currently being studied by Transport Canada.

Federal Office of Road Safety

Office of the Director  
Peter Makeham

Our Ref: K95/830

Mr. William A. Boehly  
Associate Administrator for Research and Development  
National Highway Traffic Safety Administration  
Department of Transportation  
400 Seventh Street SW  
Washington DC 20590  
USA

Dear Mr Boehly

Thank you for your letter of 26 December 1995 regarding the discussions during the meeting on the international harmonization of research in Geneva last December.

As I articulated in Geneva, Australia supports broader international cooperation at the research stage to develop globally harmonized vehicle safety standards. In order of priority, Australia sees the following research topics as worthy of our resources into the next century:

- Offset frontal crash standard to address lower extremity injuries
- "Smart" airbag systems
- Harmonized side impact standard
- Pedestrian Safety
- Vehicle Compatibility
- Intelligent Transport Systems

The attached paper expands on these topics and provides the objectives of each project.

I also think we need to give attention to the process side of the issue - how do we go about harnessing the collective expertise to produce harmonized requirements? While history is not encouraging, I think we need to take advantage of what I see as an opportunity to set effective processes in place. The EEVC work on offset frontal crash protection might offer a useful model.

I agree with your proposal to have a meeting with the ESV focal points on these issues in Melbourne. My preferences for a meeting time would be (in order of preference) Sunday May 12, Thursday May 16 or Friday May 17 but I would, of course, be please to fit in with any consensus decision. An issue to be taken into account is that by Thursday, delegates will have been there for four days and there is a likelihood of "conference fatigue". On this basis, Sunday might be a better choice if this is possible.

Thank you for inviting me to comment on these issues. I believe that the initiative is worthwhile and you have our support.

Yours sincerely

Peter M. Makeham

19 January 1996

**PRIORITY RESEARCH TOPICS**  
**(Submitted by the Australian Federal Office of Road Safety)**

## **INTRODUCTION**

Vehicle safety research relies on crash statistics to tell us what the problem areas are. Accident statistics tell us that frontal and side impact crashes cause the majority of road trauma each year. In addition, pedestrians account for nearly 20% of fatalities annually.

We generally have good information on fatalities. What the statistics don't tell us very well is a detailed breakdown of what injuries to focus on and the how they are caused. There are many injuries which result in lifelong debilitation which translates to enormous social cost.

We believe that there is a need to give more attention towards injury reduction. While many of the countermeasures will reduce both deaths and injuries, there may be areas of investigation which have the potential to reduce injuries per se; e.g. mitigation of leg injuries by better design.

The globalization of the vehicle industry and the various economic forums involving countries in different continents are providing impetus to the development of globally harmonized standards.

Australia believes that the **BIG** problems are the same - frontal and side impacts, and pedestrian safety. The smaller problem areas are those unique to particular countries.

## **1 AN OFFSET FRONTAL CRASH STANDARD TO ADDRESS LOWER EXTREMITY INJURIES**

### **Objective**

Mitigate debilitating lower extremity injuries in offset frontal crashes.

### **Discussion**

The National Injury Surveillance Unit's report "Road Injury in Australia 1991 " shows that patients with lower extremity injuries are hospitalised longer than any other type of injury, including head injuries. You don't die from leg injuries but the debilitation is lifelong.

Australia has been participating in the work of the European Experimental Vehicle Committee to develop a globally harmonised offset frontal crash test procedure.

Recent developments in Europe is expected to see the adoption of the EEVC work as an EEC directive early next year for implementation around 1999. It is expected that a complementary ECE Regulation be finalised and adopted very shortly.



FORS has commissioned a project to examine the likely benefits of introducing an offset frontal crash Protection ADR in addition to the full frontal rigid barrier standard (ADR 69/00).

This draft ADR on offset frontal crash protection based on the work coordinated internationally by the EEVC will be released for public comment in early 1996 and will include a draft Regulatory Impact Statement. This ADR will focus on reduction of intrusion based injuries particularly lower extremities.

## **2 "SMART" AIRBAG SYSTEMS**

### **Objective**

Maximize the protection offered by airbag systems

### **Discussion**

We already have an Australian Design Rule (ADR 69/00) in place for full frontal, high deceleration crashes based on injury criteria which will see most cars fitted with at least driver's side airbags. ADR 69/00 is essentially US FMVSS 208 except the test is only performed with the dummies restrained.

Coupled with our high seat belt wearing rate, this should see a significant reduction in fatalities and serious injuries.

However, there is scope for manufacturers to develop "smart" airbag systems which can detect whether there is an occupant in the passenger seat as well as the mass, and seating position of the occupant to enable the best firing algorithm to be used to maximize the protection provided by the airbag system.

This issue is particularly relevant in the US where the requirement is to protect both the unrestrained and the restrained occupant. This has led to injuries from aggressive airbag systems.

It is important that these issues are taken forward at an international level so that any standards flowing from this work are harmonized.

## **3 HARMONIZED SIDE IMPACT STANDARD**

### **Objective**

Harmonized dynamic side impact standard to maximise protection in a side impact crash.

### **Discussion**

There are two dynamic side impact regulations - US FMVSS 214 and ECE Regulation 95. While the intent of the two regulations are similar, the actual test procedures and injury criteria are quite different. Although some work was done initially to arrive at a harmonized standard, there is currently no activity in this area.

Vehicle manufacturers are forced to make minor design changes to the same model to make it comply with the two standards. With the global nature of the car industry it seems to make economic sense to have to design each model to one harmonized dynamic side impact regulation.

## **4 PEDESTRIAN SAFETY**

### **Objective**

Reduce pedestrian road trauma.

### **Discussion**

In Australia, pedestrians account for nearly 20% of fatalities annually. These are generally children and the aged. Similar figures are seen in other developed countries while some emerging countries are much higher.

Currently there are no requirements to measure the "pedestrian-friendliness" of a passenger car's front structure. There is a draft EEC directive as a result of work done by the EEVC but this has not been finalised into a regulation. There is an ISO working group developing a test procedure for vehicle front structures.

FORS has commissioned a literature review of recent research into the issue of pedestrian friendly vehicle front structures. This is the first part of a process of developing requirements aimed at producing pedestrian friendly vehicle front structures.

## **5 VEHICLE COMPATIBILITY**

### **Objective**

Ensure that passenger vehicles of disparate size provide equal levels of occupant protection.

### **Discussion**

With all the recent and upcoming changes to vehicle structures and restraint systems aimed at improving occupant protection in frontal and side impacts, the issue of vehicle compatibility will become increasingly important.

The fleet consists of vehicles of differing configurations, masses and sizes. Our job would be much easier if everyone drove around in identical vehicles. Unfortunately, this is not the case and the inescapable laws of physics mean that when a large heavy vehicle collides with a smaller, lighter one, the former will be the winner.

How do we provide occupants of small light vehicles the same level of protection in crashes with disparate vehicles?

This question of vehicle compatibility will occupy the efforts of road safety researchers for many years to come. Crash energy management is a closely related issue and is an important area that needs to be examined when looking at the small percentage of crashes at high speeds.

## **6 INTELLIGENT TRANSPORT SYSTEMS**

### **Objective**

Ensure compatible systems are developed for crash avoidance technology.

### **Discussion**

In recent years, there has been much work on developing intelligent vehicle systems for satellite navigation, vehicle tracking, crash avoidance and other means to improve vehicle safety in adverse traffic and weather conditions.

While there are groups overseeing the compatibility issues overall, it would probably be useful to have a vehicle systems focus on this work.

MINISTRY of TRANSPORT  
1-2 Kasumigaseki 20chome. Chiyoda-ku. Tokyo 100 JAPAN  
Tel: (03) 3581-9960 Fax: (03) 3581-1454

April 11, 1996

Mr. William A. Boehly  
Associate Administrator for Research and Development  
National Highway Traffic Safety Administration

Dear Mr. Boehly,

I have received your facsimile dated on 26th December from Mr. Watanabe for MITI. But, we, Ministry of Transport, has been the Japanese Focal Point concerning the project of harmonization of research. So, please providing to me the information concerning this project. I am enclosing a list of prior potential research topics and objectives of our country. we apologize for the delay in your receiving these document. I hope you will find this information helpful. And I inform you that Mr. Shimodaira, Director of Engineering Planning Division, Ministry of Transport, will attend the next meeting in Melbourne. And, Mr. Shimodaira's available data for meeting is following,

5:30 p.m. - 8:30 p.m. - -Thursday, May 16

Sincerely

Masakazu Kume  
Director  
Office of International Affairs  
Engineering Planning Division  
Engineering and Safety Department  
Road Transport Bureau  
Ministry of Transport

## *Japanese list of Piior Potential Research Topics and Objectives*

The order in this list is not related to our priority.

The item with "O" are most prior research topics and objectives in our country.

- O1     *Further international harmonization of light distribution characteristics of headlamps*  
(starting FY1997, term 4years)  
[Abstract of research]  
Concerning the tight distribution characteristics of headlamps, the proposal of international harmonized regulation for four common points has been prepared. But, in order to harmonize the regulation completely, we will study to harmonize the regulation about other point and criteria.
- O2     *International harmonization of geometric visibility requirements for the installation of lighting and light-signaling devices*  
(starting FY2000, term undecided)  
[Abstract of research]  
The proposal of international harmonized regulation for installation of lighting and light signaling devices has been prepared, but the geometric visibility requirements will be studied in ECE/WP29/GRE. We will study to harmonize the regulation about these requirements based on scientific ground.
3.     *Electromagnetic Consistent Character(EMC) of electric devices of motor vehicles*  
(starting FY1996, term 3years)  
[Abstract of research]  
The tendency of adopting the electric devices on motor vehicles is encouraged in the future. In EU, these requirement have been studying to standardize, And thereafter, In ECE/WP29/GRE, these requirement will be discussed Considering these tendencies, we study to get the basic data in order to establish our regulation.
4.     *Injure and Shock Tolerance in the each parts of human body*  
(starting FY 1992, term 5~10 years)  
[Abstract of research]  
In order to get the basic data to establish our future regulation, we study to make clear the relationship between intensity(tolerance) or possible moving range of the each parts of human body and injury, analyze the injury mechanism in the each parts of human body in the traffic accidents.
5.     *Dummy characteristics*  
(starting FY1996, term 3years)  
[Abstract of research]  
In order to contribute to making world common dummy, we will study the characteristics of future dummy developed in foreign countries.

6. *Future frontal collision test*  
(starting FY1996, term 3years)  
[Abstract of research]  
We will study the test by offset deformable barrier, studying as frontal collision of next stage, and we will collect the basic data to decide the future frontal collision test.
7. *Lateral collision test*  
(priority D, starting FY1995, term 5~10years)  
[Abstract of research]  
In order to get the basic data to making international harmonized regulations of lateral collision test, superior to existed test in the points of reproducibility and repeatability.
8. *Pedestrian Protection*  
(starting FY1992, term 5~10years)  
[Abstract of research]  
In order to get the basic data to study the improved measures, standards or regulations to decrease the damage of pedestrians, we study the data of pedestrian accidents.
9. *Protection of the passenger of trucks and buses*  
(starting FY1996, term 5years)  
[Abstract of research]  
We will study to get the -basic data for improvements of vehicle structure for protection of the passenger of trucks and buses, thinking it problem socially recently.
10. *ITS*  
(starting FY1996, term 5~10years)  
[Abstract of research]  
We will study the measures of structures and devices of motor vehicle in the ITS technologies.
11. *The measures for Traffic Safety*  
(starting FY1996, term 5~10years)  
[Abstract of research]  
After we will research for the traffic situation, the realities of traffic accident in our country and other countries, we will collect the basic data in order to establish or revise our safety regulations in future.

## APPENDIX C

International Harmonized Research Agenda Meeting  
Sunday, May 12, 1996  
Attendees

<u>Attendee</u>	<u>Country/Organization</u>
Mr. Peter Makeham and Mr. Dennis McLennan	Australia
Mr. Harvey Layden and Mr. Dainius Dalmotas	Canada
Mr. Herbert Henssler	EC
Dr. Prof Bernd Friedel	Federal Republic of Germany and the EEVC
Mr. Jean-Pierre Medevielle	France
Mr. Takashi Shimodaira and Mr. Naoki Esumi, Mr. Yoshiyuki Mizuno	Japan
Mr. W. Przybylski	Poland
Mr. Kåre Rumar	Sweden
Mr. Keith Rodgers and Mr. Richard Lowne	United Kingdom
Mr. Michael Brownlee and Mr. Frank Turpin, Ms. Linda O'Connor Dr. Ricardo Martinez	United.States United States

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**JAPAN****Mr. Masakazu Kume**

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**POLAND****Mr. Wojciech Przybylski, M.Sc.**

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**(or)****NETHERLANDS****Mr. Gerard J.M. Meekel M.Sc.**

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